



Strengthening the enabling environment for farmer-led solar based irrigation development

Petra Schmitter, World Bank

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Water



Solar based irrigation configurations in two contrasting “landscapes”



India:

- 21-22 million pumps
(70% electric, 29 % diesel, 1 % solar)
- Subsidy and cash

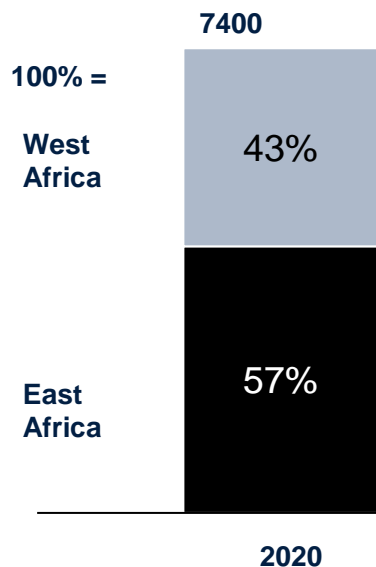


Sub-Saharan Africa:

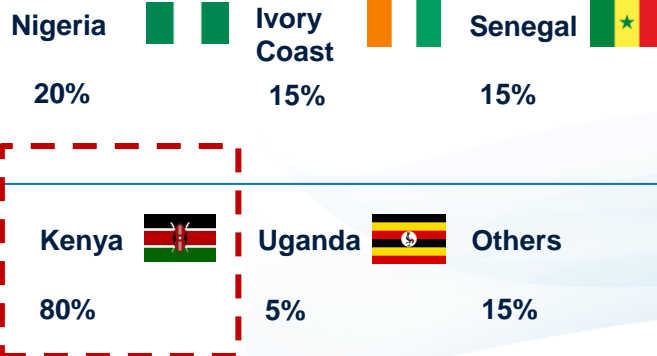
- < 50,000 sold (10,000/year)
- Limited reporting on sales
- Mainly PAYGO (80%) and cash
- Some subsidy schemes emerging at scale (Togo, Uganda, ...)

East Africa remains the largest SWP market in Sub-Saharan Africa, but West Africa is emerging...

SWP sales in Sub-Saharan Africa, 2020
Number of units sold



Top markets in the region



...Kenya accounts for 80% of the regional sales

Kenyan market is expected to grow even bigger in coming years driven by:

- Expansion of **PAYGO** (Pay-as-you-go) and other innovative financing models, off-setting high upfront cost of SWPs and improving **affordability**
- **Digital integration** of agriculture value chains with irrigation ecosystem, leading to:
 - Increased awareness of SWPs
 - Better access to inputs, training and extension services
 - Expansion of viable market-linkage models (out-grower schemes), reducing transaction costs
- Increasing number of **smallholders** are entering into export-oriented value chains or switching to **high-value cash crops**, creating huge demand of irrigation

Market size estimated at ~ USD 0.5 Bn but remains under-penetrated in Sub-Saharan Africa...

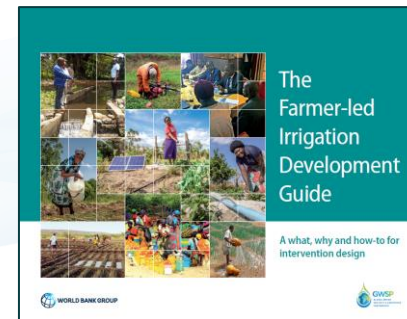
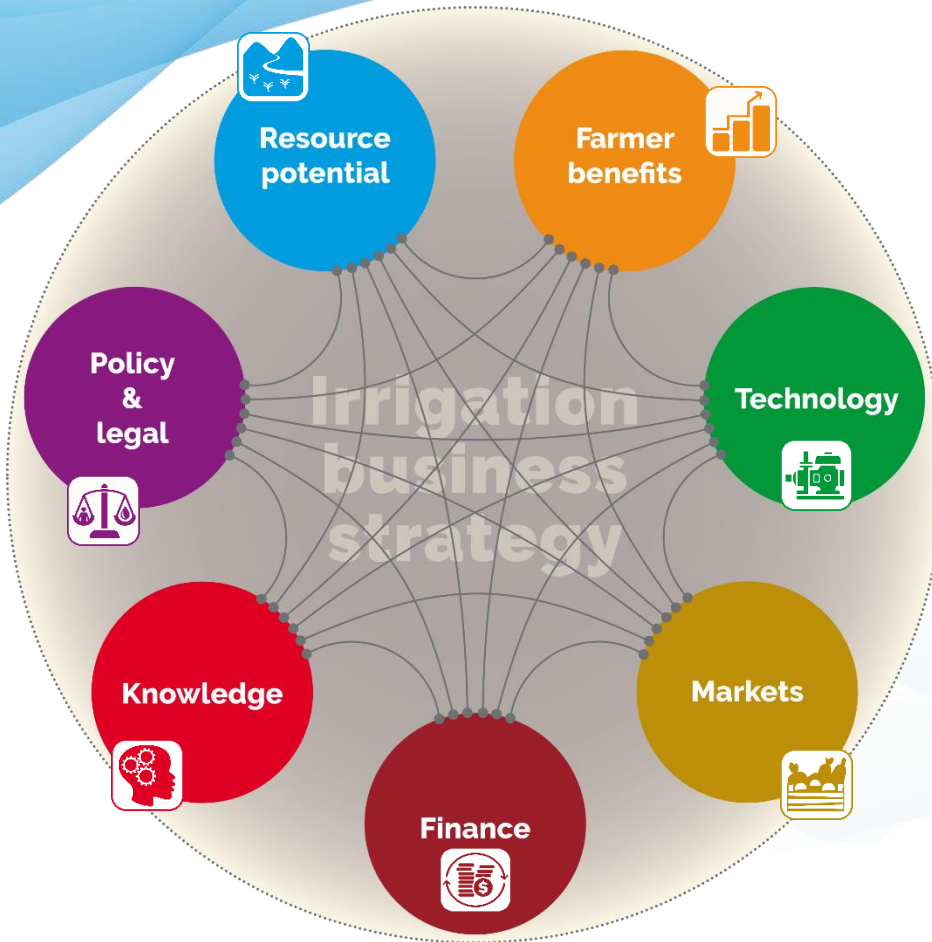
... expected to grow 3X by 2030



- SWPs uptake could increase to 2.8 Mn households ~USD 1.6 Bn (India: ~USD 15.1 Bn => 9.4 Bn)
- Growth is driven by:
 - ☐ Increased demand for irrigated products (domestic/global)
 - ☐ Less reliable climate conditions;
 - ☐ Improved supply conditions (price, finance, ICT)

Farmers, farming systems and therefore business strategies are diverse.

Understanding supply and demand for solar irrigation is key to scale



Rationale for solar irrigation

- How much water and land is available for irrigation?
- Is water being overused/extracted for agriculture?



Resource potential

Farmer benefits



- What are the different farmer segments that can benefit from solar irrigation adoption?
- Is solar irrigation economically a viable solution?

What are the current policies that support solar irrigation adoption and solar irrigation markets?

Policy & legal



Technology



Is solar irrigation equipment and services easily accessible and of good quality to the farmers? Do they meet farmer needs?

Do farmers have access to extension services (ag, finance, tech) and do other actors have sufficient capacity?

Knowledge



Markets



Are input (fertilizer, seed, solar pumps) & output markets well established and do farmers have easy access?

Finance

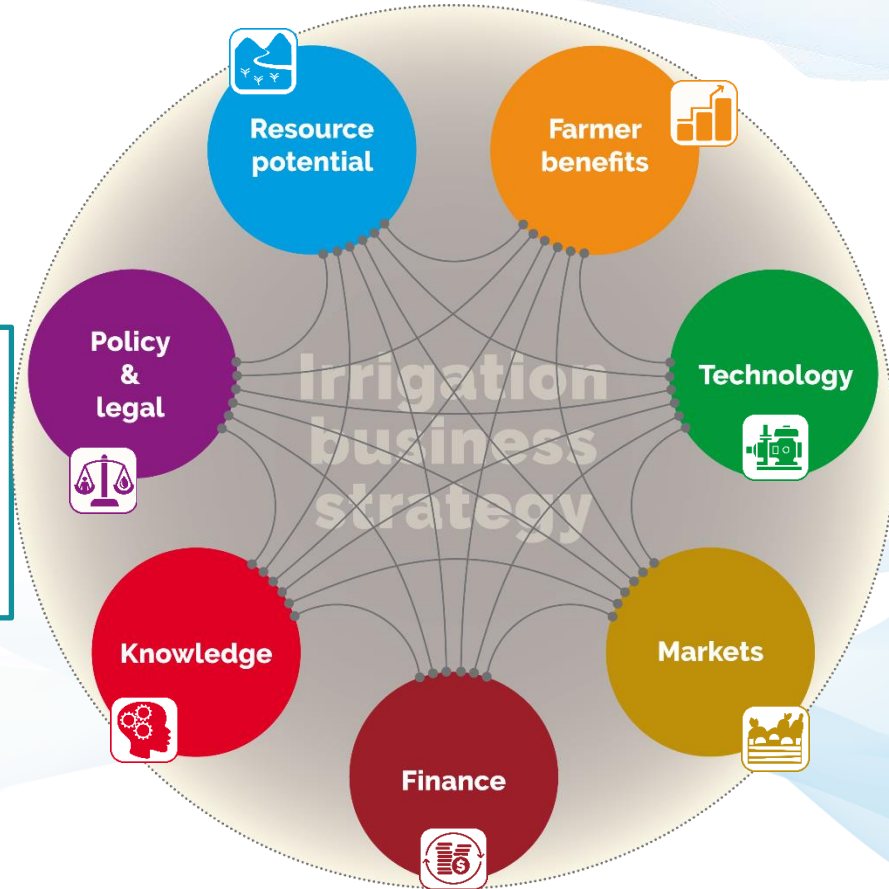


Is the financing ecosystem for solar irrigation pumps well developed and do farmers have easy access?

Enabling conditions

Irrigation business strategy

So what are the key back and forward linkages in sub-Saharan Africa?



- ✓ Groundwater availability 20-fold greater than surface water resources
- ✗ Lack of higher resolution information on availability in space and time

- ✓ Removal of trade tariffs, tax exemptions, subsidy schemes
- ✗ Poor integration and coordination of water, energy and agricultural policies

- ✓ Growing experience in solar irrigation across water, energy and agricultural sector
- ✗ Limited knowledge exchange across sectors



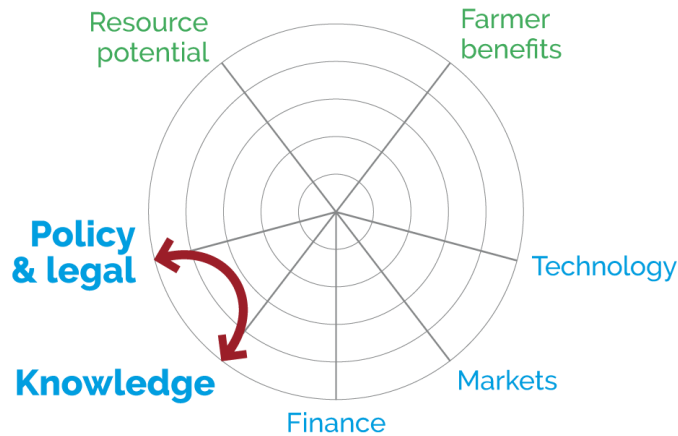
- ✓ Increase in production, income and climate resilience
- ✗ Awareness on benefits and perception of risk

- ✓ Range of solar pumps; ICT4Ag and IoT
- ✗ Poor quality standards and assurance; poor pre-and after sale services

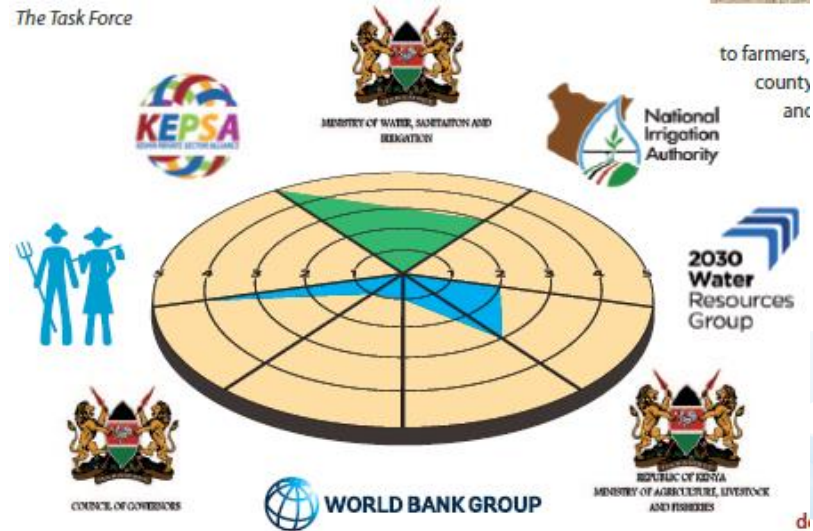
- ✓ High market potential and steady growth for small-scale SWP markets
- ✗ Lack of integration of the irrigation equipment/service and agricultural value chains

- ✓ Increased private investment and public funding; emerging consumer financing models
- ✗ Poor coordination across financing mechanisms; increased risk by the private sector to fill consumer financing gap

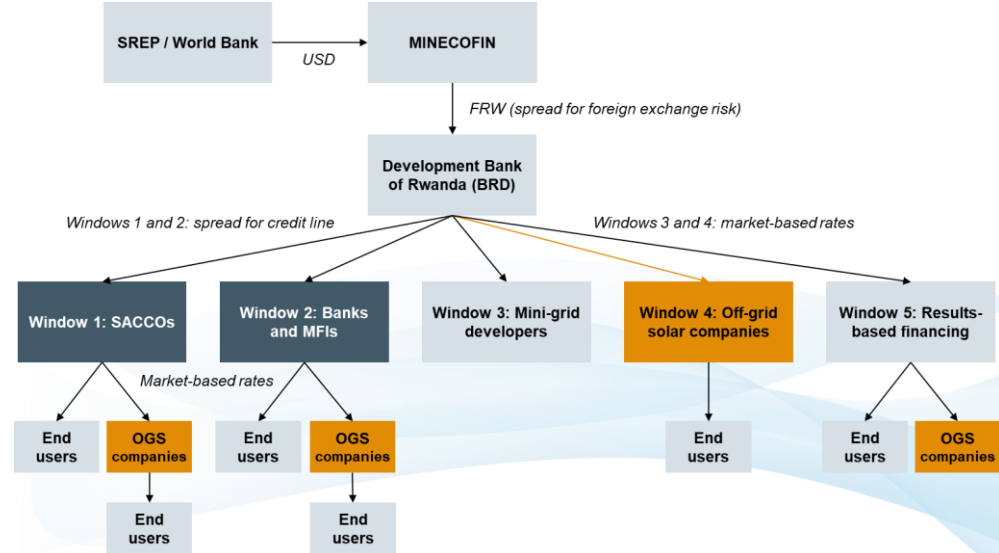
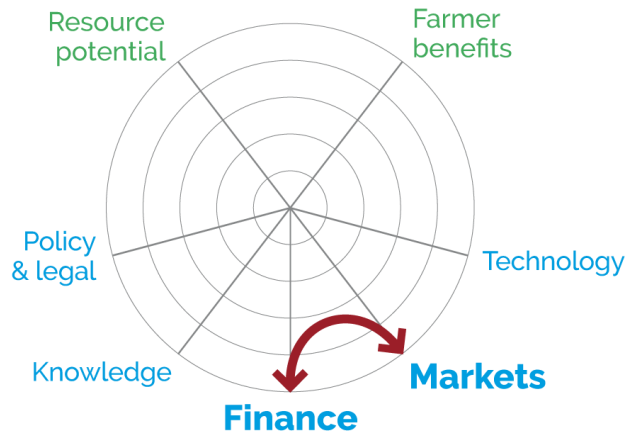
Strengthen collaboration through multi-stakeholder platforms - Kenya



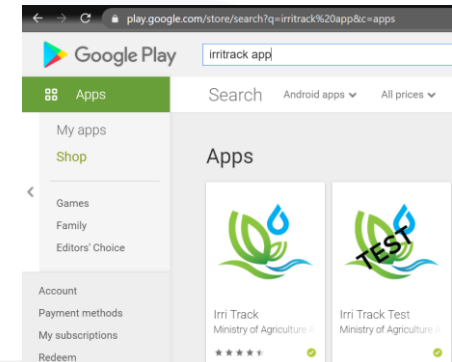
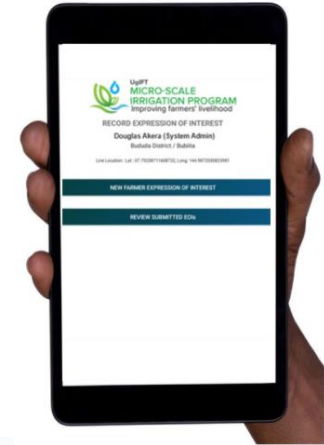
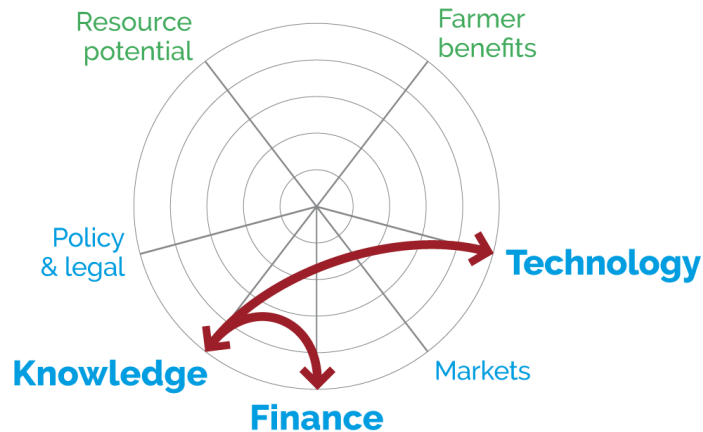
The Task Force



Strengthen supply chains and consumer access to finance - Rwanda



Lower upfront investment cost- Uganda



Unlocking sub-Saharan Africa's solar irrigation potential



Be **inclusive of actors** when evaluating national and local barriers to solar irrigation as there are no silver bullets nor one single actor



Reduce risks for farmers and private sector companies within solar irrigation supply/service and value chains



Strengthening the financing ecosystem for the supply and demand side



Strengthen knowledge and institutions for sustainable water governance and solar expansion



Thank you



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Petra Schmitter, World Bank
E: pschmitter@worldbank.org